The Collaboration Between Art and Technology: Making Disney Animation's "Myth: A Frozen Tale"

Jeff Gipson
Walt Disney Animation Studios

Jose Luis Gomez Diaz
Walt Disney Animation Studios

Michael Anderson
Walt Disney Animation Studios

Edward Robbins
Walt Disney Animation Studios

Brittney Lee
Walt Disney Animation Studios

Nicholas Russell
Walt Disney Animation Studios

Figure 1: Visual Development for the enchanted forest at different moments of the story

ABSTRACT

"Myth: A Frozen Tale" is a VR short film created at Walt Disney Animation Studios. Inspired by the folklore of "Frozen", the film is a fairy tale within a fairy tale which explores the past, present, and future of the elemental spirits of "Frozen 2". The result is a visual poem which combines Disney Animation's heritage of 2D animation, music, and real-time technology in novel ways.

To create an engaging, emotional experience on par with the initial designs, our team was presented with a number of technical and procedural challenges. This is the studio's first use of Unreal Engine, so a significant amount of experimentation was necessary to find the workflow and VR integration techniques needed to achieve the high level of production quality we strive for.

In this talk, the team will explore many of these aspects of the production process. Using two case studies, we will discuss the design, challenges, collaborative workflows, and technological execution needed to bring "Myth: A Frozen Tale" to life.

CCS CONCEPTS

• **Computing methodologies** → **Virtual reality**;

KEYWORDS

production, animation, virtual reality, VR, storytelling

1 INTRODUCTION

Inspired by the folklore of "Frozen", "Myth: A Frozen Tale" uses VR to transport viewers into a mystical and enchanted forest where the elemental spirits from "Frozen 2" come to life and reveal the tale behind their past and future. The film has been carefully art directed with a stylized storybook production design (examples in Figure 1) and uses the latest techniques in real-time technology, combining CG and traditional animation, spatial sound and an original score to immerse the audience in the story. Drawing from the heritage of Disney animation, films such as "Fantasia" and "Peter and the Wolf" inspired the work. The filmmakers wanted Myth to pay homage to the history of animation by having music drive the narrative. It is not just the rhythm of the film, but the score that points directly to the heartbeat of the storytelling. Each character has its own unique musicality, playing into duality of the elements – the protagonistic and the antagonistic – suggesting the balance that keeps the world of Myth in harmony.

Myth integrates both 2D and CG animation. Similar techniques have been used extensively in the games industry and have been applied in our shorts and feature films. Here we extend the use in new ways for VR. The CG characters, environments, and effects are combined with traditional 2D effects, working together seamlessly to enhance the story experience, adding to the scale and drama of the film, while keeping consistent with the stylized art direction.

2 INNOVATIVE WORKFLOWS

To create this film we grew on the techniques we described in our Cycles talk [Gipson et al. 2018]: VR Storyboards were heavily used to define the space and proximity of the actions. A new technique used was the multi-user sessions allowed by Unreal Engine. We could have multiple people at the same time, in the same session, reviewing a scene in VR while different artists were applying modifications to address the notes of the director or production designer.

A new in-house tool named Swoop was developed and used for planning and animating objects attached to a path. This tool has an authoring component in VR that allows artists to be immersed on the set and capture the timing and shape for the animation path. This works in real-time, giving immediate feedback for the artists, allowing them to quickly iterate and create as many versions as needed to get to the desired result. A separate component in Maya can be used to polish both shape and timing. Finally the curves are exported to be used in the final piece.

3 CASE STUDIES

The film is made up of many unique moments, and describing how all of them were accomplished is beyond the scope of this talk. As a sample the following sections provide details on one of the environments and one of the characters.

3.1 Enchanted Forest

The challenge was to create a very stylized design inspired from cutouts and shadow boxes and implement it into a 3D world in which the viewer could feel immersed. One of the most defining features is how the background is bright and the foreground is dark as it would be in a backlit shadow box, inviting you to explore inward (see Figure 2a). We created a black proscenium that surrounds the viewer. This acts as a framing element for key points in the story, while also directing attention outwards into the world by keeping the closest elements completely black and devoid of details.

Very specific colors were used to define and differentiate every character moment. Using these key colors, we created a series of color ramps, one set for the world elements and another set for the skydome. We mapped these ramps to our environment based on distance to the viewer, that way we can transform the color palette of the full environment by just changing the ramps. In order to give more richness to the environment we combined the ramps with simple graphic textures projected onto the ground plane, adding a suggestion of detail without introducing too much visual noise (see Figure 2b). To bring this all together, we developed a system where we can transition between any two color schemes in real-time. In doing so everything is updated accordingly to display its correct color based on its world position and the current story moment.

3.2 Fire Salamander

We wanted to be as close as possible to the quality of the models in our feature films. With the constraints on performance for a VR real-time playback we had to do an optimization pass. We started with the assets from the film but we reduced the polygon count and created UVs and new textures as opposed to the PTex [Burley

and Lacewell 2008] texture mapping that we use in our movies. We used our production rig for animation so that we could reuse our regular workflows and tools, but then exported all the animation to a simplified rig. After that, we did a pass on technical animation to make sure all the shapes and silhouettes followed the art direction and those modifications were exported as blendshapes to be used by the game engine over the regular skinning.

The salamander character has two different looks in the film, and it needs to transition seamlessly from one to another in real-time. We developed a shader with a parameter that allowed us to interpolate between the two looks as needed. In one of the states, the salamander is on fire (see Figure 3) and we used a combination of CG effects and 2D traditional animation mapped on cards to create this very stylized effect. For the animation, we created different clips and we composed a state machine that allows some interaction between the user and the salamander. Finally we used our Swoop path tool, to animate the fire trail left behind by the salamander. Bringing this character to life is the perfect representation of the collaboration between all the departments, art and the latest technologies.

4 CONCLUSIONS

Leveraging the studio's talented effects team, the filmmakers were able to create a film that celebrates the heritage of animation while looking to the future of storytelling using real-time technology.

The enchanted forest was just one of the sets. We also had to create a cabin with the look of the world of Arendelle, as well as a magical environment where music, traditional animation and color meld in synchronicity at the zenith of our story. Likewise, we had to repeat the complexity of the fire salamander and bring to life the five members of the family that guide the viewer to the beginning of the story, a Wind Spirit, a Water Horse and the Earth Giants.

Close collaboration across all of the production departments was needed to complete "Myth: a Frozen Tale" with the desired stylized art direction and optimal performance in VR. Art and technology combine in a visual poem set in an immersive world which lives and breathes. The end result is a VR film rooted in the traditions of animation, utilizing both 2D and CG techniques, that we hope audiences will remember interacting with for many years to come.

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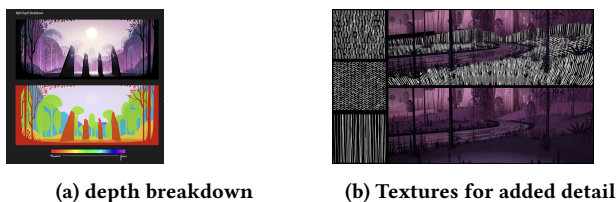(a) depth breakdown   (b) Textures for added detail

Figure 2: Environment Details.

Figure 3: Fire Salamander visual development